INDIANA DEPARTMENT OF TRANSPORTATION

INTER-DEPARTMENT COMMUNICATION

Standards Section – Room N642

Writer's Direct Line
232-5353

January 7, 2005

MEMORANDUM

TO: Standards Committee

FROM: Dannie L. Smith, Secretary

RE: Agenda for the January 20, 2005 Standards Committee Meeting

A Standards Committee meeting is scheduled for 9:00 a.m. on January 20, 2005 in the N755 Executive Conference Room. The following agenda items are listed for consideration.

Old Business

Item 51-19 Standard Drawing	Mr. Caplinger 802-SNGP-05	1/20/05	3

New Business

Item 1-1 106.01	Mr. Miller Source of Supply and Quality Requirements	1/20/05 107	6
Item 1-2 601.02	Mr. Miller Materials	1/20/05 347	8
Item 1-3 Standard Drawings	Mr. Cales 610-DRIV-01 thru 13	1/20/05	9
Item 1-4 617	Mr. Miller ~~GEOGRID FOR SUBGRADE STABILIZATION OR MODIFICATION~~ *BLANK*	1/20/05 389	29
Item 1-5 703.02	Mr. Miller Materials	1/20/05 465	30
Item 1-6 *801.10*	Mr. Kuchler *Temporary Traffic Barriers*	1/20/05 807 SS	31
Item 1-7 *801.17*	Mr. Kuchler *Method of Measurement*	1/20/05 815 SS	35
Item 1-8 *801.18*	Mr. Kuchler *Basis of Payment*	1/20/05 8174 SS	36

Item 1-9 Standard Drawing	Mr. Caplinger 802-SNWW-07	1/20/05	37
Item 1-10 910.01(a)	Mr. Miller General	1/20/05 711	39
Item 1-11 910.01(b)9	Mr. Miller Epoxy Coated Reinforcing Bars	1/20/05 713	40
Item 1-12 910.01(b)10	Mr. Miller Dowel Bars	1/20/05 714	41
Item 1-13 910.09	Mr. Miller Guardrail	1/20/05 721	42
Item 1-14 910.12 910.12~~(a)~~ 910.12~~(b)~~	Mr. Miller ~~Samples and~~ Certification of Guardrail~~, Posts. Accessories, Fittings, and Hardware~~ *Suppliers* ~~Control Procedure for Furnishing Steel Beam Guardrail and Accessories~~ ~~Aluminum Guardrail~~	1/20/05 725 725 726	43
Item 1-15 910.13 910.13*(a)* 910.13~~(a)~~ *(b)* 910.13*(b)*1 910.13*(b)*2 910.13~~(b)~~ *(c)*	Mr. Miller Steel Fence Posts *Line Posts* Tubular Steel Fence Posts Group 1 Group 2 Fence Fastenings	1/20/05 726 726 726 727 727 727	45
Item 1-16 910.18(b)4	Mr. Miller Barbed Wire	1/20/05 733	47
Item 1-17 913.07.1	Mr. Poturalski Tubular Marker	1/20/05 760	48
Item 1-18 Standard Drawing	Mr. Poturalski 801-TVDV-01	1/20/05	49
Item 1-19 915.04(b)	Mr. Miller Materials	1/20/05 870	52
Item 1-20 Design Policy	Mr. Cales Low Volume Roads	1/20/05	54

cc: Committee Members (7)
Districts (28)
FHWA (3)
ICI Representative (1)
IMAA Representative (1)
APAI Representative (1)
CE of I Representative (1)
ADS Representative (1)
Mirich Representative
ACPA Representative (1)
Contech Representative (1)
IKO Representative (1)
Bridgetek Representative (1)
INDOT Toll Road (3)
Traffic Design (3)
Estimators (3)
Specification Writers (4)

Item No. 51-19
Mr. Caplinger
Date: 1/20/05

REVISION TO STANDARD DRAWINGS

802-SNGP-05 Sign Data Tables

This revises the torque required for base plate & stiffener plates.

Other sections containing specific cross references:

None

General Instructions to Field Employees
Update Required? Y___ N___
By - Additional or Revision

Frequency Manual
Update Required? Y____ N____
By – Addition or Revision

Recurring Special Provisions potentially affected:

None

Standard Sheets potentially affected:

See Above

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn. Resubmit? _____

Received FHWA Approval? ____

INDIANA DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
INDIANAPOLIS, INDIANA 46204-2249
INTER-DEPARTMENT COMMUNICATION

December 13, 2004, 2004

MEMORANDUM

TO: Thomas Caplinger
Road Design Engineer

FROM: Dale Louie DL
Engineer of Sign and Lighting Design

SUBJECT: Wide Flange Base Plate Torque, Bolt Diameter, and Overhead Structure Bracing

We would like to make a revision on the above standards. We feel the current torque values are not structurally adequate and sound. Also the bolt diameters shown on March 1, 2005 CD are correct, but with one exception as shown in this revision. We submit these proposed details to the Spec. Committee for review and approval.

BASE PLATE & STIFFENER PLATE DATA TABLE

Post Size	Bolt Size	Torque in. - lb	Wt. of 4 Plates (One Post) ,lb	Wt. of 4 Stiffeners (One Post) ,lb	A	B	C	D	E	R	d4	t_1	t_2	W
W6 x 9	$\frac{5}{8}$" ø x 2 $\frac{3}{4}$"	~~350~~ 450	5.10	3.33	4½"	2"	1⅜"	2½"	1"	11/32"	1⅜"	½"	½"	3/16"
~~W8 x 10~~			~~6.38~~	~~4.07~~	~~5"~~	~~2¼"~~	~~1½"~~	~~2⅞"~~	~~1⅛"~~		~~1½"~~	"	"	"
W8 x 13			12.6	7.97	6"	2½"	"	3⅛"	1 7/16"		1¾"	¾"	¾"	¼"
~~W8 x 15~~			~~"~~	~~"~~	~~"~~	~~"~~	~~"~~	~~"~~	~~"~~		~~"~~	~~"~~	~~"~~	~~"~~
W8 x 18			"	"	"	"	"	"	"		"	"	"	5/16"
W10 x 19	$\frac{3}{4}$"ø x 3 $\frac{1}{2}$"	750	14.04	8.66	"	2¾"	1½"	3⅝"	1 3/16"		2¼"	¾"	¾"	5/16"

NOTE:

1. For location of Data Table dimensions, see Standard Drawing E 802-SNGP-04

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN DATA TABLES

MARCH 2005

STANDARD DRAWING NO. E 802-SNGP-05

RICHARD L. VANCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

Item No. 1-1
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 106, BEGIN LINE 3, DELETE AND INSERT AS FOLLOWS:

106.01 Source of Supply and Quality Requirements

The Contractor ~~may be required to~~ *shall* furnish *the Engineer with* a complete statement of the origin, composition, and manufacture of any or all materials to be used in the construction of the work *at the Preconstruction Conference. If, during the course of the contract, changes or additions to the statement are required, the Contractor shall provide the information 5 working days prior to the source supplying materials to the site* ~~together with samples, which may be subjected to the tests provided for in these specifications to determine their quality and fitness for the work~~.

SECTION 106, AFTER LINE 45, INSERT AS FOLLOWS:

The basis for use of materials shown in the List of Approved or Prequalified Materials will be the Engineer's verification that the materials provided are included in the List of Approved or Prequalified Materials.

Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: 106-C-074	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

To facilitate the automation of contract sampling and testing requirements through SiteManager, this specification modification needs to be made. Although INDOT request this information from the contractor the specifications do not require the submittal presently. INDOT specifications allow contractors various options for many materials and to facilitate the automation process, settings must be made to reflect these options. The District Testing Engineers will be responsible for making these setting changes after being informed by the contractor.

Spec	Page	Section	Line	Remarks
106	107	106.01	1	Delete and Insert the following:

106.01 Source of Supply and Quality Requirements. The Contractor shall furnish the Engineer with a complete statement of the origin, composition, and manufacture of any or all materials to be used in the construction of the work at the Preconstruction Conference. If, during the course of the contract, changes or additions to the statement are required, the contractor shall provide the information 5 working days prior to the source supplying materials to the site.

Deleted: may be required to

Deleted: together with samples, quality and fitness for the work

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 601, BEGIN LINE 14, DELETE AND INSERT AS FOLLOWS:

Steel Thrie-Beam Rail.....910.09~~(a)~~
Steel W-Beam Rail.....910.09~~(a)~~
Timber Posts and Blocks.....911.02(f)

All guardrail, post, accessories, fittings, and hardware shall be supplied from a source listed on the Department's list of approved Certified Guardrail Suppliers in accordance with 910.12. Guardrail end treatments shall be selected from the Department's list of approved Guardrail End Treatments in accordance with 601.07 and impact attenuators shall be selected for the Department's list of Approved Impact Attenuators in accordance with 601.07.1.

Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

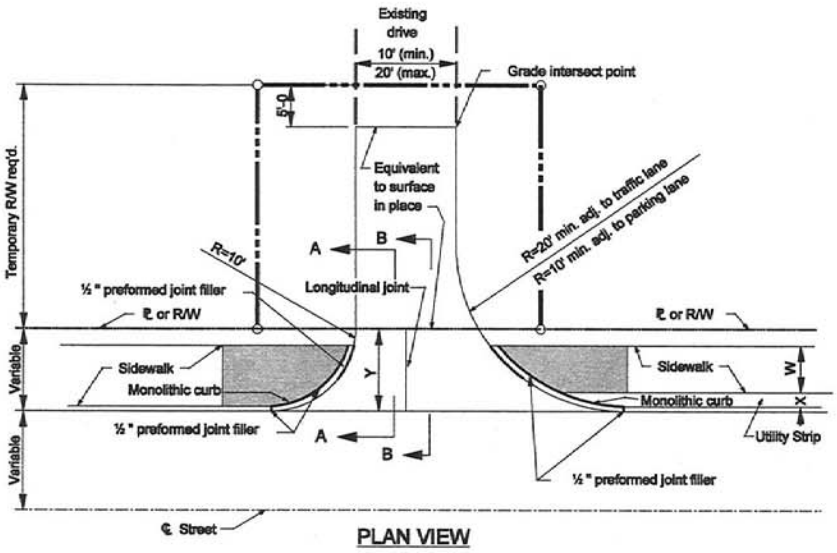
Item No. 1-3
Mr. Cales
Date: 1/20/05

REVISION TO STANDARD DRAWINGS

610-DRIV-01, Class I Drive
610-DRIV-02, Class II Drive
610-DRIV-03, Class III Drive
610-DRIV-04, Class IV Drive
610-DRIV-05, Class V Drive, Field Entrance
610-DRIV-06, Class VI Drive, Plan & Sections
610-DRIV-07, Class VII Drive and Joint Placement Detail
610-DRIV-08, Class I and III Drive Grade Profiles
610-DRIV-09, Class II and Class IV Sections
610-DRIV-10, Class II, IV, and V Drives, Approach Grades
610-DRIV-11, Class VI Drive, Typical Profile Grades
610-DRIV-12, Class VII Drive, Joint Placement and Corners
610-DRIV-13, Drives, General Notes and Legend

The above sheets have been rearranged since the last approval and the drive profile grades have been revised

Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: SEE ABOVE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____



PLAN VIEW

NOTES:

1. See Standard Drawing E 610-DRIV-13 for General Notes.
2. See Standard Drawings E 604-SDWK-01 or E 604-SDWK-02 for sidewalk elevation transition details.
3. See Standard Drawings E 610-DRIV-03 for concrete curb and gutter connection detail.
4. See Standard Drawings E 610-DRIV-07 for PCCP joint placement detail.
5. Class I drive pavement shall be 6 in. PCCP over 6 in. of compacted aggregate base..
6. See Standard Drawings E 610-DRIV-08 for section A-A and B-B.

LEGEND

W = Width of sidewalk
X = Distance between back face of curb and sidewalk.
Y = Distance from front face of curb to ℄ or R/W
Sidewalk elevation transition.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS I DRIVE

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-01

RICHARD L. VERCLER REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

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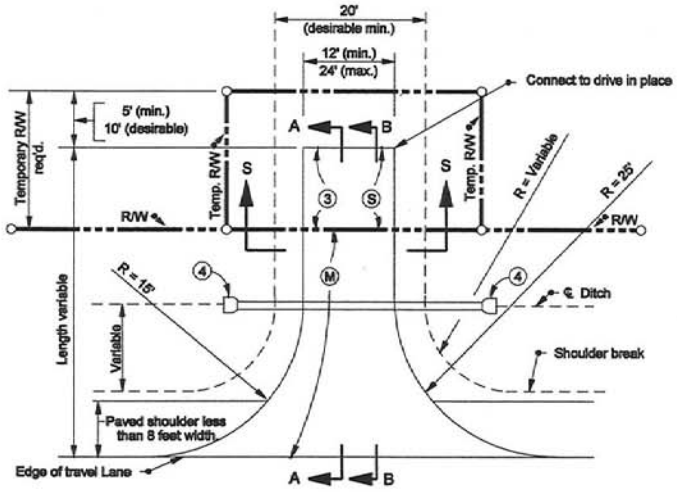
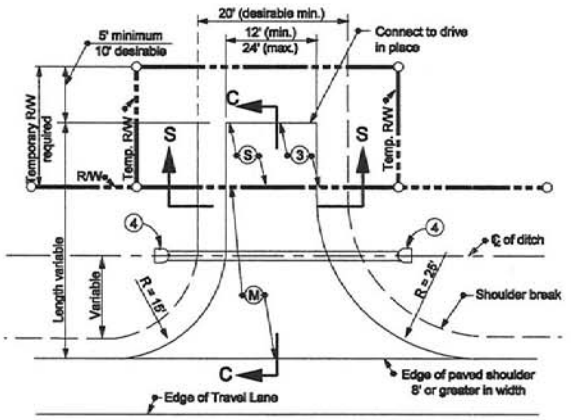


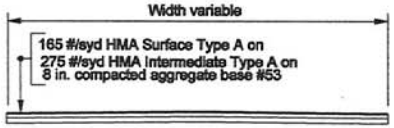
PLAN VIEW
(PAVED SHOULDER LESS THAN 8 FEET IN WIDTH OR UNPAVED SHOULDER)



PLAN VIEW
(PAVED SHOULDER 8 FEET OR GREATER IN WIDTH)

NOTES :

1. See Standard Drawing E 610-DRIV-13 for General Notes and Legend.
2. See Standard Drawing E 610-DRIV-10 for Sections A-A, B-B and C-C.
3. See Standard Drawing E 610-DRIV-10 for approach grades.
4. See Standard Drawing E 610-DRIV-09 for Section S-S.



HMA FOR APPROACHES
TYPICAL SECTION

LEGEND

Ⓜ Limits of HMA for approaches on comp. agg. base.

Ⓢ Equivalent to surface in place

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS II DRIVE

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-02

RICHARD L. VOELKER REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

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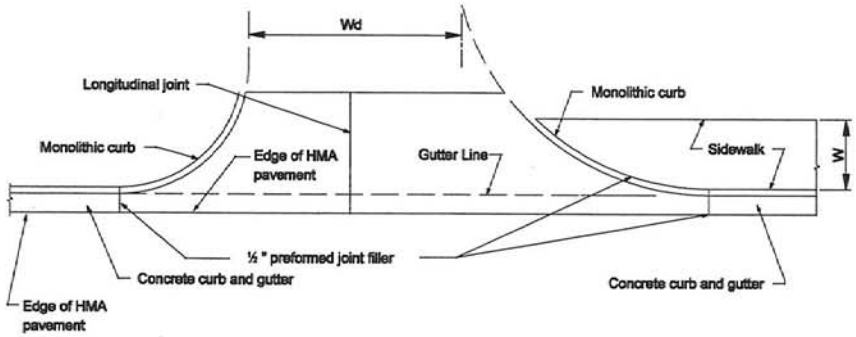
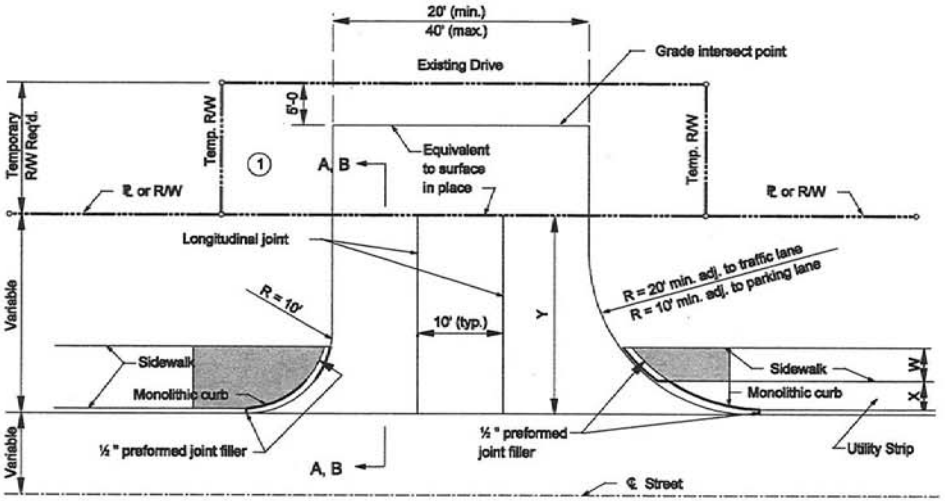


CONCRETE CURB & GUTTER CONNECTION FOR CLASS I & III DRIVES



PLAN VIEW - CLASS III DRIVE

NOTES :

① See Standard Drawing E 610-DRIV-08 for Section A-A, and Section B-B.

2. For Class III drive, PCCP pavement for driveways shall be placed over 6 in. of compacted aggregate base.

3. See Standard Drawings E 604-SDWK-01 or E 604-SDWK-02 for side walk elevation transition details, or Standard Drawing E 604-SWCR-09 for sidewalk curb ramp details if the drive is signalized.

LEGEND

W = Width of sidewalk

Wd = Driveway width

X = Distance between back face of curb and sidewalk

Y = Distance from front face of curb to ℄ or R/W

Sidewalk elevation transition.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS III DRIVE

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-03

RICHARD L. VONCLEVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

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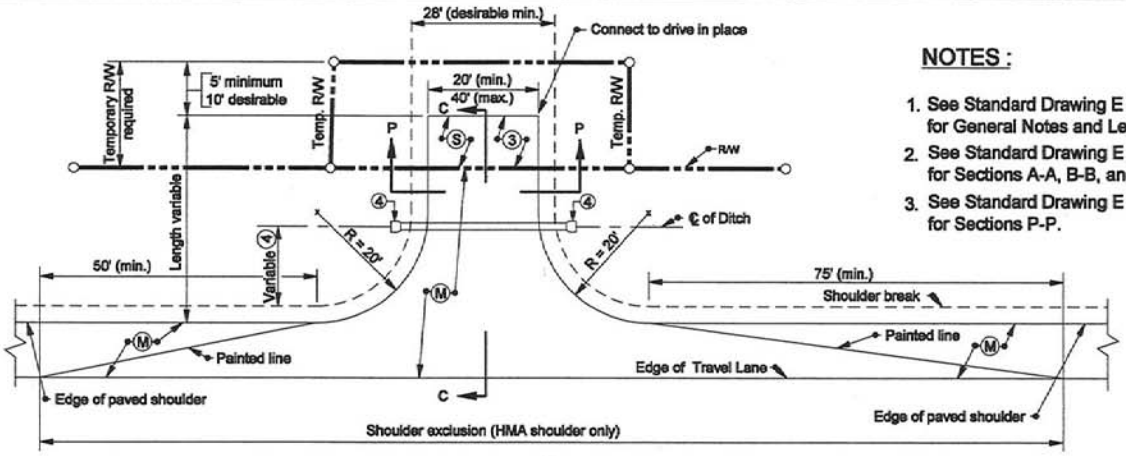
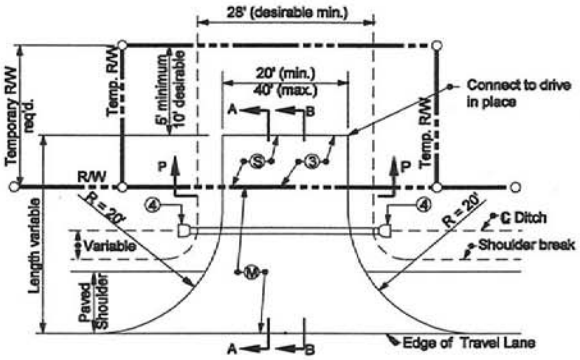


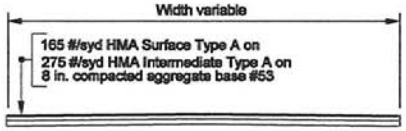
PLAN VIEW

(PAVED SHOULDER 8 FEET OR GREATER IN WIDTH)



PLAN VIEW

(PAVED SHOULDER LESS THAN 8 FEET IN WIDTH OR UNPAVED SHOULDER)



HMA FOR APPROACHES

TYPICAL SECTION

NOTES :

1. See Standard Drawing E 610-DRIV-13 for General Notes and Legend.
2. See Standard Drawing E 610-DRIV-10 for Sections A-A, B-B, and C-C.
3. See Standard Drawing E 610-DRIV-09 for Sections P-P.

LEGEND

Ⓜ Limits of HMA for approaches on comp. agg. base.

Ⓢ Equivalent to surface in place

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS IV DRIVE

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-04

RICHARD L. VOELLER REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

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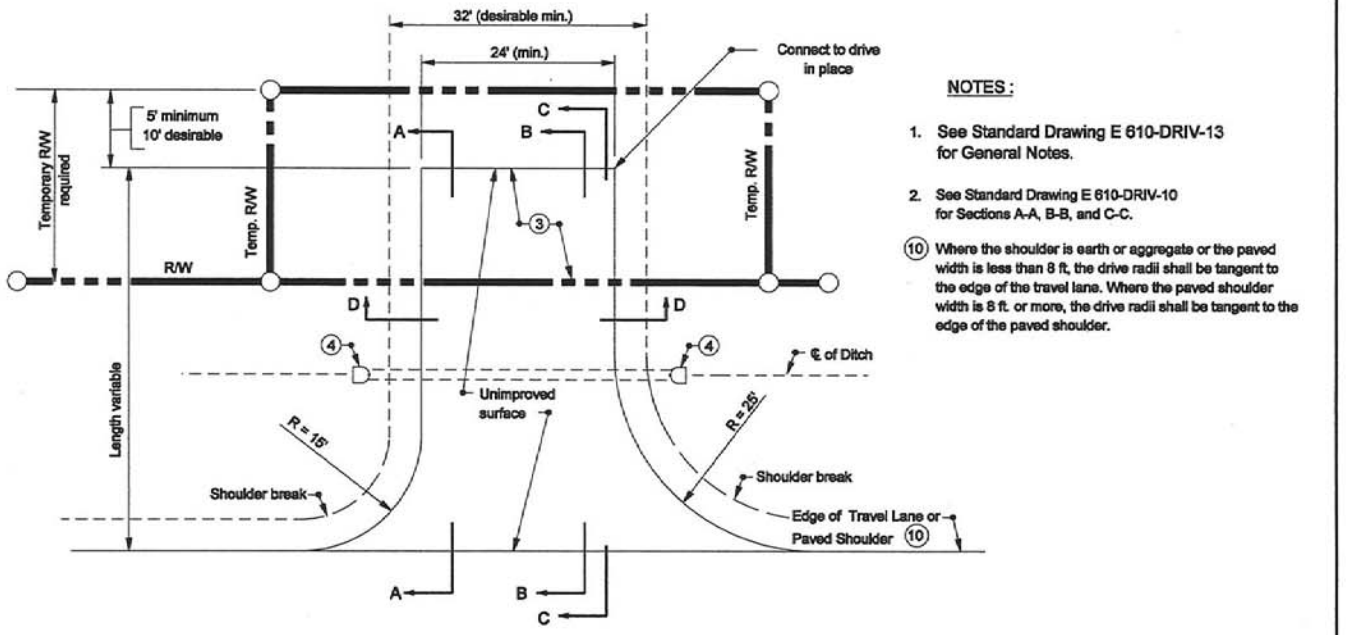
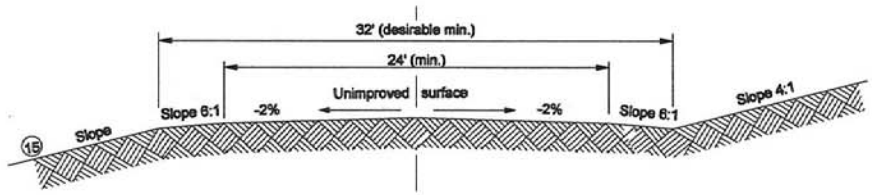


PLAN VIEW



SECTION D-D

NOTES :

1. See Standard Drawing E 610-DRIV-13 for General Notes.
2. See Standard Drawing E 610-DRIV-10 for Sections A-A, B-B, and C-C.

(10) Where the shoulder is earth or aggregate or the paved width is less than 8 ft, the drive radii shall be tangent to the edge of the travel lane. Where the paved shoulder width is 8 ft. or more, the drive radii shall be tangent to the edge of the paved shoulder.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS V DRIVE FIELD ENTRANCE

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-05

ANTHONY L. DREMOV REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

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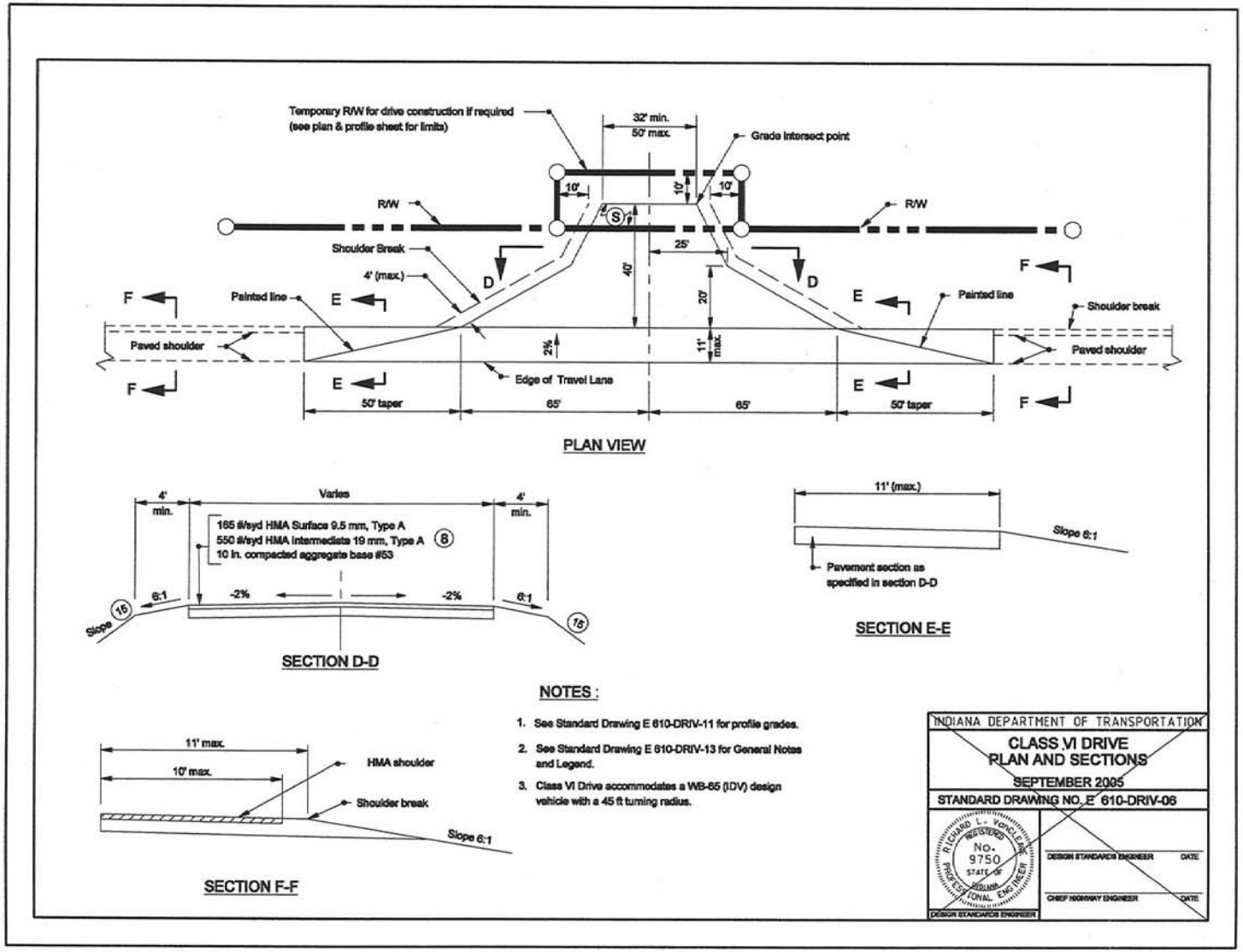

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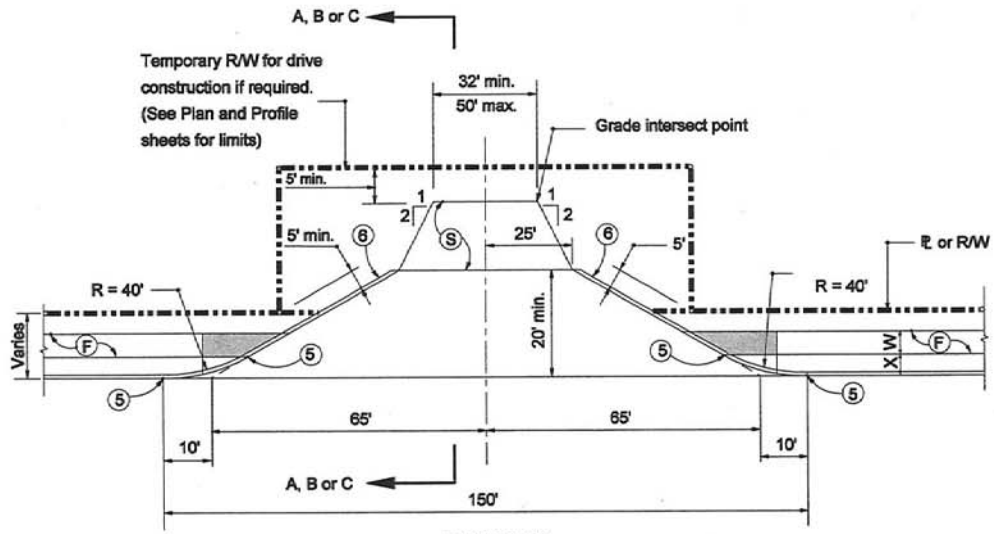
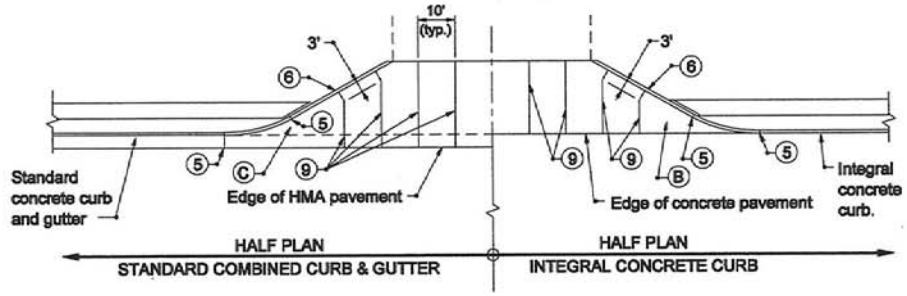


PLAN VIEW



JOINT PLACEMENT DETAIL

NOTES :

1. All Class VII drives shall be concrete to at least the Right-of-Way line with minimum length 20'.
2. See Standard Drawing E 610-DRIV-13 for General Notes and Legend.
3. See Standard Drawing E 610-DRIV-12 for sections A-A, B-B, and C-C.
4. Joint Placement Detail should be used with Class I, III and VII drives.
5. The Class VII Drive accommodates a WB-65 (IDV) design vehicle with a 45 ft. turning radius.

(B) Use ear construction Type B as on Standard Drawing E 605-ERCN-02.

(C) Use ear construction Type A as on Standard Drawing E 605-ERCN-01.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS VII DRIVE AND JOINT PLACEMENT DETAIL

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-07

RICHARD L. VANCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

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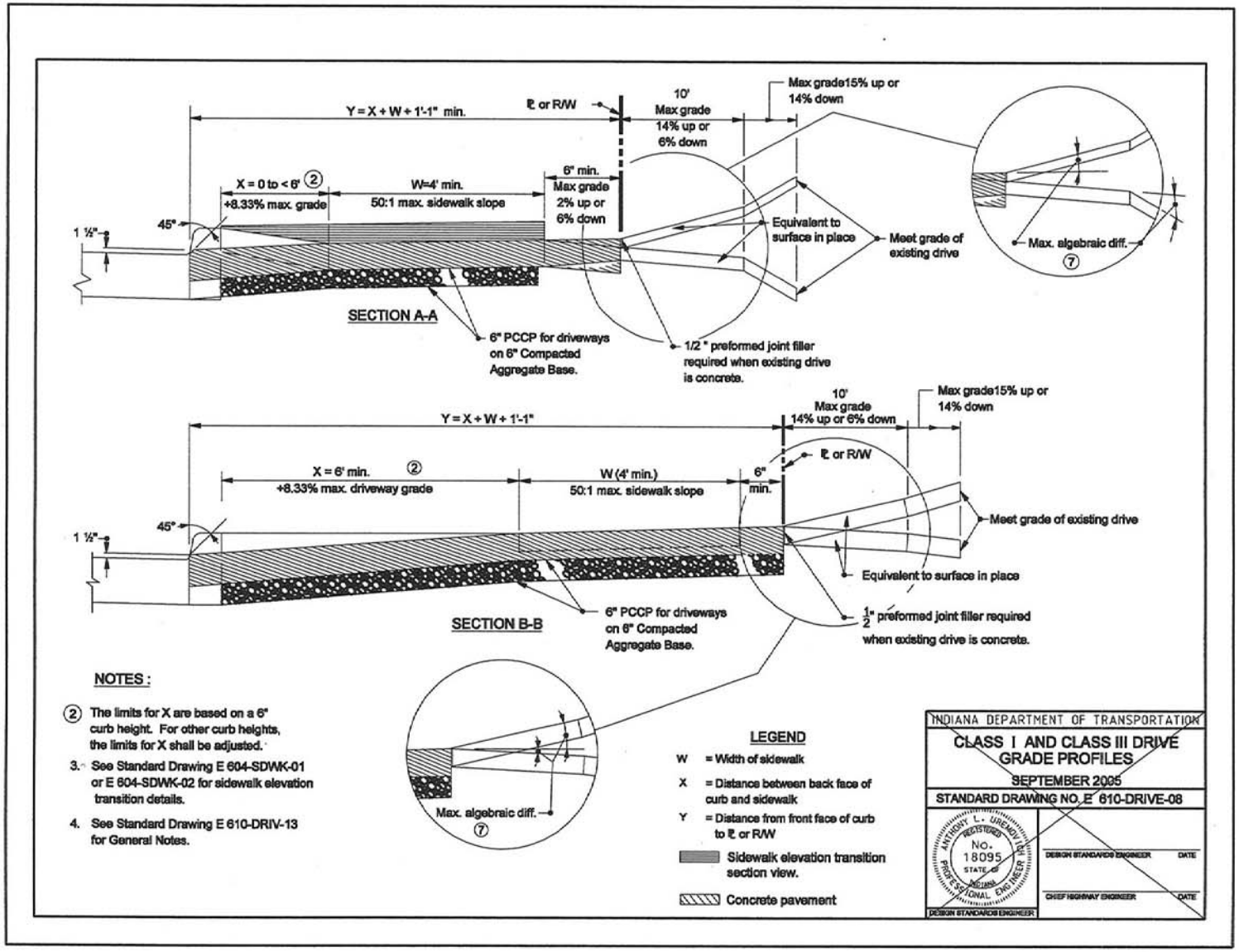

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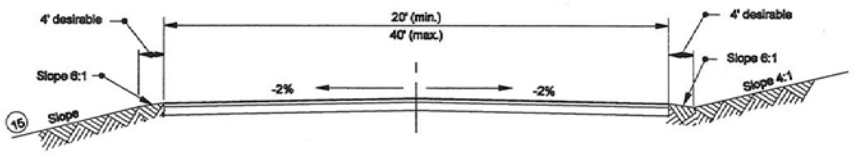
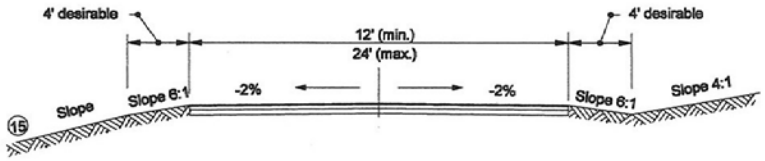


SECTION P-P - CLASS IV DRIVES



SECTION S-S - CLASS II DRIVES

NOTES:

1. See Standard Drawing E 610-DRIV-02 for Class II drive details.
2. See Standard Drawing E 610-DRIV-04 for Class IV drive details.
3. See Standard Drawing E 610-DRIV-13 for General Notes.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS II AND CLASS IV SECTIONS

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-09

RICHARD L. VOELKER REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

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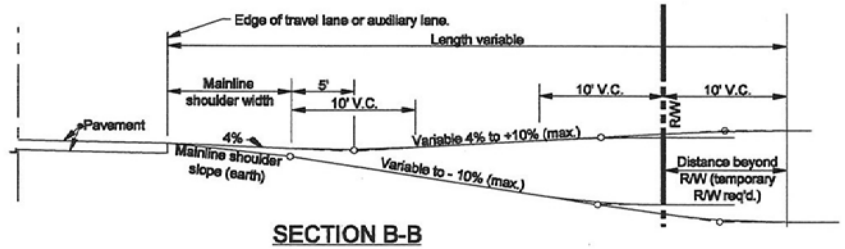
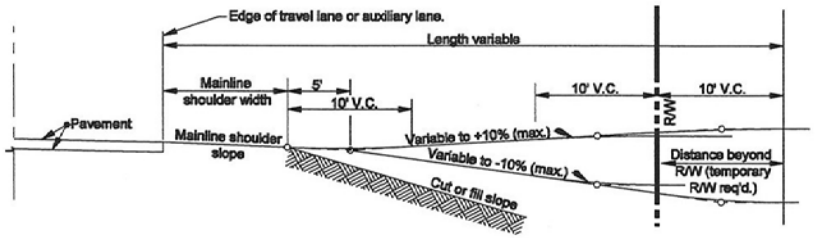


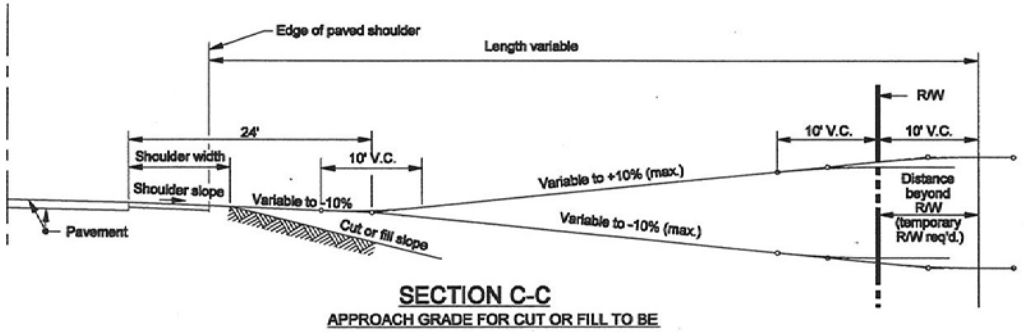
SECTION B-B

APPROACH GRADE FOR CUT OR FILL
TO BE USED WITH EARTH SHOULDERS



SECTION A-A

APPROACH GRADE FOR CUT OR FILL TO BE USED WITH
LESS THAN 8 FEET WIDE PAVED OR COMPACTED AGGREGATE SHOULDERS



SECTION C-C

APPROACH GRADE FOR CUT OR FILL TO BE
USED WITH PAVED SHOULDER 8 FEET OR WIDER

NOTES :

1. See Standard Drawings E 610-DRIV-02, -04 and -05 for location of Sections A-A, B-B and C-C.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS II, IV, & V DRIVES
APPROACH GRADES
SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-10

RICHARD L. VONCILLE — REGISTERED — No. 9750 — STATE OF INDIANA — PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER — DATE

CHIEF HIGHWAY ENGINEER — DATE

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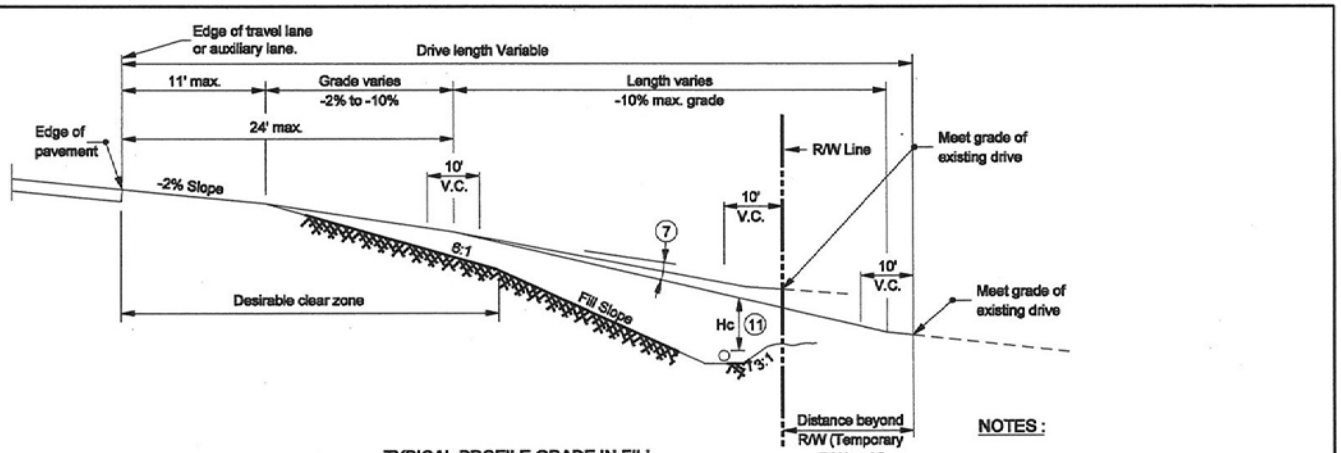
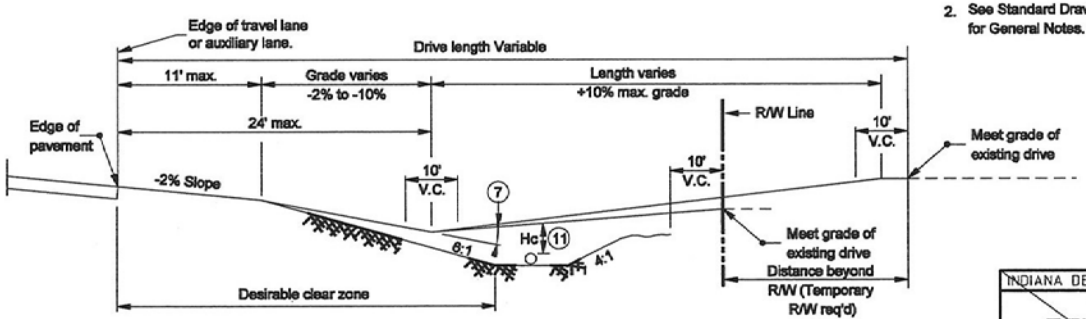


TYPICAL PROFILE GRADE IN FILL



TYPICAL PROFILE GRADE IN CUT

NOTES :

1. See Standard Drawing E 610-DRIV-06 for plan and sections of Class VI drive.
2. See Standard Drawing E 610-DRIV-13 for General Notes.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS VI DRIVE
TYPICAL PROFILE GRADES

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-11

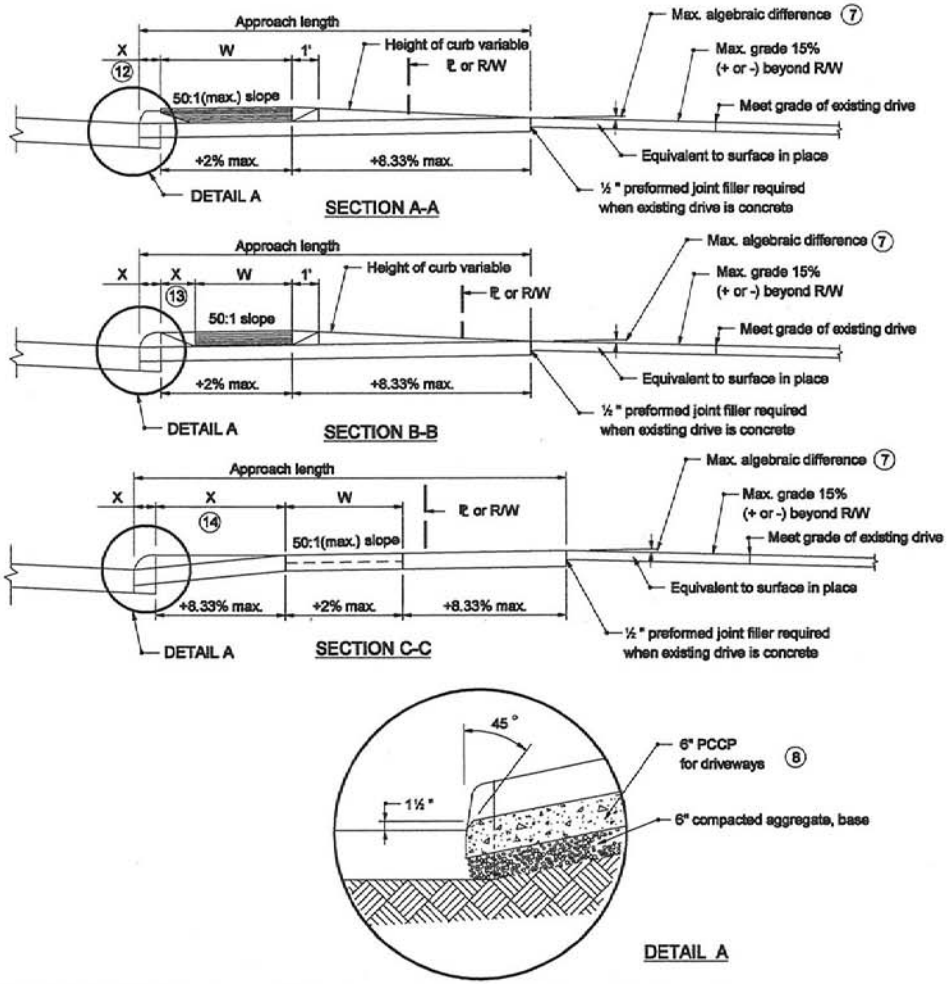
ANTHONY L. UREMOVIC REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE

CHIEF HIGHWAY ENGINEER DATE

...\610-DRIV-11_REV_SEP_01_2005.dg 11/23/04 08:11:16 AM



NOTES :

1. See Standard Drawing E 610-DRIV-07 for plan of Class VII drive.
2. See Standard Drawing E 610-DRIV-13 for General Notes and Legend.

INDIANA DEPARTMENT OF TRANSPORTATION

CLASS VII DRIVE
PROFILE GRADE & DETAIL A

SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-12

RICHARD L. VONCLEAVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

/s/ Richard L VanCleave
DESIGN STANDARDS ENGINEER — DATE

/s/ Richard K Smutzer
CHIEF HIGHWAY ENGINEER — DATE

...\610-DRIV-12_REV_SEP_01_2005.dg 11/16/04 01:11:14 PM

GENERAL NOTES :

① These notes apply to Standard Drawings E 610-DRIV-01 through 12.

2. If a concrete approach is designed for a class II or class IV drive, the radii shall be constructed using ear construction type C as detailed on Standard Drawing E 605-ERCN-02.

③ When the maximum approach grade of ±10% does not meet the grade of the existing drive before the R/W line, the approach grade of ±10% shall extend beyond the R/W to the point of intersection with the existing driveway grade. Construction beyond the R/W line shall be done in temporary R/W.

④ The appropriate pipe end treatment should be provided for pipes located either inside the clear zone or outside the clear zone.

⑦ The maximum algebraic difference in grades shall not exceed 8% for crested grade nor 12% for sagged grades.

⑧ The minimum driveway pavement sections for Class VI and Class VII Drives have been designed for 200 trucks per day. If the truck traffic count is greater than 200 per day, the required pavement section shall be as shown elsewhwere on the plans.

⑪ Hc - earth cover over culvert or pipe shall be 1 ft or greater.

⑫ Curb ramp type H, as shown on Standard Drawing E 604-SWCR-09, when the approach is signalized, or a sidewalk elevation transition as shown on Standard Drawing E 604-SDWK-02 shall be used when sidewalk is adjacent to curb.

⑬ When X is equal to or greater than 2 ft but less than 6 ft, either a curb ramp type G as shown on Standard Drawing E 604-SWCR-09, when the approach is signalized, or a sidewalk elevation transition as shown on Standard Drawing E 604-SDWK-01 shall be used.

⑭ When X is equal to or greater than 6 ft, no curb ramp or sidewalk elevation transition is required unless the curb height is in excess of 6 inches.

⑮ Driveway embankment slope within the clear zone for a road functionally classified as follows shall be:
a.) 6:1 for an arterial or a high speed (50 mph or greater design speed) collector.
b.) 4:1 for a local road or a low speed (less that 50 mph design speed) collector.

LEGEND

⑤ ½ in. preformed joint filler
⑥ Monolithic curb
⑨ Longitudinal joint
Ⓕ Concrete sidewalk
Ⓢ For type and thicknes equivalent to surface in place, see plans.

X = Distance between face of curb and sidewalk
W = Width of sidewalk
Cement Concrete Pavement for Driveways
Curb ramp, if signalized, or typically, sidewalk elevation transition.
Curb ramp or sidewalk elevation transition section view.

INDIANA DEPARTMENT OF TRANSPORTATION

DRIVES
GENERAL NOTES AND LEGEND
SEPTEMBER 2005

STANDARD DRAWING NO. E 610-DRIV-13

RICHARD L. VANCLEVE REGISTERED No. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER
DESIGN STANDARDS ENGINEER

DESIGN STANDARDS ENGINEER DATE
CHIEF HIGHWAY ENGINEER DATE

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INDIANA DEPARTMENT OF TRANSPORTATION

INTER-DEPARTMENT COMMUNICATION

Standards Section – Room N642

Writer's Direct Line
232-6775

December 22, 2004 DRAFT

DESIGN MEMORANDUM No. 04-__
TECHNICAL ADVISORY

TO: All Design, Operations, District Personnel, and Consultants

FROM: _____
Anthony L. Uremovich
Design Policy Engineer
Contracts and Construction Division

SUBJECT: Drives

SUPERSEDES: *Indiana Design Manual* Section 46-11.0

EFFECTIVE: April 20, 2005, Letting

I. GENERAL INFORMATION

A. Definitions of Drives and Types

The definitions of types and classes of drives are as follows:

1. Residential. A residential drive provides access to a single family residence, duplex, or apartment building with not more than four dwelling units. A residential drive along a roadway with a raised curb is a class I drive. A residential drive along a roadway with a paved or unpaved shoulder and no raised curb is a class II drive.

2. Commercial. A commercial drive provides access to an office, retail, or institutional building, or to an apartment building with five or more dwelling units. A drive which serves an industrial plant, but with a primary function to serve an administrators' or employees' parking lot, is considered to be a commercial drive.

A commercial drive along a roadway with a raised curb is a class III drive. A commercial drive along a roadway with a paved or unpaved shoulder and no raised curb is a class IV drive.

3. Industrial. An industrial drive directly serves substantial numbers of truck movements to and from loading docks of an industrial facility, warehouse, or truck terminal. A centralized retail development, such as a community or regional shopping center, may have one or more drives especially so designed, signed, and located to provide access for trucks. This is also classified as an industrial drive. An industrial drive may be designed either as a public road approach or as an industrial drive. An industrial drive along a roadway with a raised curb is a class VII drive. An industrial drive along a roadway with a paved or unpaved shoulder and no raised curb is a class VI drive.

4. Field Entrance. A field entrance provides access to an unimproved property, e.g., a farm field with no buildings. Such a drive along a roadway with a paved or unpaved shoulder is a class V drive.

B. Drive Spacing and Corner Clearances

Closely spaced drives can cause operational problems, especially with high-volume roadways and/or high-volume drives. These problems can also result if drives are too close to at-grade intersections.

Desirably, any part of a drive, including its entrance radius, should not be placed within the radius of a public road at an intersection, including any auxiliary lanes. Preferably, there should be a 6- to 12-m (20- to 40-ft) tangent section between the drive radius and the public road radius for greater separation. If this criterion cannot be met for a property at an intersection corner, one solution may be to relocate the drive entrance from the major road to the minor road, if practical. Another possible solution is to provide a right-turn lane at the intersection. This will improve the operation of the intersection by removing the turning vehicles for the drive and intersection out of the through travel lane(s). However, significant numbers of turning vehicles may impair egress from the property.

Drives for the same owner should be located across from each other (e.g., farms) where crossing traffic is significant or where it is not desirable to permit slow or large equipment to travel along the highway or shoulder.

C. Drive Sight Distance

Indiana Design Manual Section 46-10.0 discusses intersection sight distance (ISD) criteria for intersections with public roads. Desirably, these criteria will also apply to sight distance at drives. However, for drives with low volumes, it is not warranted to explore extraordinary measures to improve sight distance. Sight obstructions, e.g., large trees, hedgerows, etc., should be checked for in the vicinity of the drive entrance which may limit sight distance. To perform the check, it is reasonable to assume an eye location of approximately 3 m (10 ft) from the edge of travel lane.

If drive sight-distance criteria with the eye location described above cannot be met, informal notification should be provided to the project reviewer for a consultant-designed project or to the supervisor for an in-house project.

D. Auxiliary Lanes

Deceleration and acceleration lanes should be considered at high-volume drive entrances, especially on a high-speed, high-volume arterial. *Indiana Design Manual* Sections 46-4.0 and 46-7.0 further discuss the design and warrants for these auxiliary lanes, which may also apply to high-volume drives. In addition to traffic-volume considerations, it may be warranted to provide a right-turn lane into the drive if the change in grade is abrupt at the drive entrance.

E. Joint Residential or Commercial Drives

If practical and agreeable to the property owners, the use of a joint drive offers one option to reduce the number of access points along the highway. The centerline of the joint drive should be located on the property line dividing the two owners. This practice will not allow either owner the opportunity to deny or restrict access to the neighbor's property and, depending on the traffic volume, may improve the traffic flow on the mainline. For a commercial drive, this may require providing a drive wide enough to handle two-way traffic.

II. DESIGN CRITERIA

The Recurring Plan Details series 604-R-485d, attached hereto, provide the Department's design criteria for the various drive classes. In addition to such series, the following should be considered.

A. Class Determination Considerations

1. If it is determined at the field inspection that a field entrance serves a barn or storage shed for farm machinery, it should be designed as a class II drive instead of a class V drive.

2. Where there are positive indications that a private residence is being used for commercial purposes, the drive should be designed as a commercial drive.

B. Radii

1. Class II and class IV drive radii should start from the edge of the paved shoulder if the width of the paved shoulder is 2.4 m (8 ft) or greater.

2. Class II and class IV drive radii should start from the edge of the traveled way if the width of the paved shoulder is less than 2.4 m (8 ft).

3. Class VI drive tapers should start from the edge of the traveled way without regard to the shoulder's width or whether or not the shoulder is paved.

C. Width

1. Drive width should be measured perpendicular to the centerline of the drive.

2. For each new drive constructed where no drive currently exists, the minimum width shown on Recurring Plan Details series 610-R-485d should be used, unless determined otherwise at the field inspection or if the Land Acquisition Division recommends a wider width.

3. The width of a reconstructed drive should be the same as the existing width but not less than the minimum width nor greater than the maximum width shown on Recurring Plan Details series 610-R-485d.

4. Each drive that serves a barn or storage shed for farm equipment should be 7.2 m (24 ft) in width.

D. Drive Grades

For a class I, III, VI, or VII drive, the maximum algebraic difference in drive grades should not exceed 8% for a crest vertical curve, or 12% for a sag vertical curve. For a class II, IV, or V drive, the maximum algebraic difference in drive grades should not exceed 11% for a crest vertical curve, or 14% for a sag vertical curve.

If it is known that large emergency vehicles or other large vehicles will be using a drive, or if the algebraic differences exceed those noted above, the fit of the drive grade should be checked against the vehicle templates.

Drive grades should be shown and drive PVIs should be identified on the cross-sections sheets.

E. Grading

The drive's embankment slope within the mainline clear zone should be as shown in Figure 04-21A, Drive Embankment Slopes.

Slope	Arterial	Collector	Local Road
6:1	All	Design Speed ≥ 80 km/h (50 mph)	n/a
4:1	n/a	Design Speed < 80 km/h (50 mph)	All

DRIVE EMBANKMENT SLOPES

Figure 04-21A

E. Paving

1. Each residential, commercial, or industrial drive should have either an asphalt or concrete surface as shown on Recurring Plan Details series 610-R-485d from the edge of the mainline pavement to at least the highway right-of-way line. The drive pavement should be replaced in kind beyond the right-of-way line.

2. A field entrance typically has an unimproved soil surface within the right-of-way.

F. Intersecting Sidewalk Treatment

1. Sidewalk curb ramps should only be used with signalized class III or class VII drives.

2. For class I drives or nonsignalized class III or class VII drives, a sidewalk elevation transition as shown on Recurring Plan Details 604-R-484d, Pages 14 and 15, attached hereto, should be used.

III. Impacts to Project with Drive Designs Complete and Right of Way Acquisition Under Way

Class I and III drives in a project to be let before September 2005 should have grades designed in accordance with the current INDOT *Standard Drawings*. However, the grades for such drives should be checked for accessibility by large emergency vehicles or other large vehicles.

Class I and III drives in a project to be let during or after September 2005 should have grades designed in accordance with the recurring plan details attached hereto. However, if the profile-grade requirements shown in the recurring plan details extend already-designed drives outside the available right of way, such drives should have their grades detailed on the plans so that the drives remain inside the available right of way. Such drives should also be checked for accessibility by large emergency vehicles or other large vehicles. Such drives should be identified as modified.

IV. Implementation

Recurring Plan Details series 610-R-485d, and also 604-R-484d, Pages 14 and 15, both attached hereto, should be called for through the August 17, 2005, letting. Beginning with the September 14, 2005, letting, the recurring plan details will be incorporated into revised INDOT *Standard Drawings*. The details will then no longer be required to be called for in specific contracts.

alu
Attachments

[F:\Des\04__-ta]

Item No. 1-4
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 617, LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 617 – ~~GEOGRID FOR SUBGRADE STABILIZATION OR MODIFICATION~~ *BLANK*

SECTION 617, DELETE LINES 2 THROUGH 89.

Geogrid has been placed in Section 214. When this was done, we forgot to delete Section 617.

Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

Item No. 1-5
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 703, AFTER LINE 12, INSERT AS FOLLOWS:

All uncoated reinforcing bars and epoxy coated reinforcing bar shall be supplied from a source listed on the Department's list of Certified Uncoated Reinforcing Bar Manufacturers and Certified Reinforcing Bar Epoxy Coaters respectfully.

Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 801, BEGIN LINE 305, INSERT AS FOLLOWS:

801.10 Temporary ~~Concrete~~ Traffic Barriers.

Temporary ~~concrete~~ traffic barriers shall be one of the following three types as shown on the plans.

Type 1.

Type 1 temporary traffic barriers shall be used to separate two-way traffic and shall be precast concrete in accordance with applicable requirements of 707 and 602 and as shown on the plans. Type 1 barriers may also be used to separate traffic from the work zone. The surfaces of individual precast units shall vary no more than 6 mm (0.25 in.) in 3 m (10 ft) from the specified cross section, as measured from a longitudinal straightedge. The maximum variation in the vertical and horizontal alignment of adjacent units shall be 6 mm (0.25 in.) across the joint, as measured from a 3 m (10 ft) longitudinal straightedge. Sections that have obvious defects or visual cracks shall not be used. Sections that develop any of these conditions during the contract shall be repaired with concrete or replaced within a reasonable amount of time.

Units precast after March 1, 2003 shall be clearly marked with the name or trademark of the manufacturer, the year of manufacture, and "INDOT". The markings shall be indented on an end or on the top of each barrier section. Units Precast prior to 2003 shall not be used after January 1, 2012.

Type 2.

Type 2 barriers may be used to separate traffic from the work zone. Type 2 temporary traffic barriers shall meet the appropriate test level 2 or 3 NCHRP 350 crash test standards and shall be approved for use by the FHWA. A 350 crash test standard certification and a letter of approval from the FHWA shall be provided the Engineer prior to placing the unit. The unit selected shall be appropriate for the location considering the maximum posted speed limit on the project and the allowable area for deflection. The unit shall be installed according to the manufacturer's recommendations.

If concrete barriers are used as type 2 barriers, they shall be in accordance with the requirements for type 1 barriers.

Type 3.

Type 3 temporary traffic barriers shall be those type 1 temporary traffic barriers that are to be left in place at the completion of the contract and shall become the property of the Department. They shall be like new at the completion of the contract. All necessary delineation and required anchor systems shall be left in place.

Type 4.

Type 4 temporary traffic barriers shall be those types that are intended to be readily moveable to accommodate the shifting of traffic lanes on a daily basis to better facilitate the changing volumes of traffic during the peak hours of a day. Type 4 temporary traffic barriers shall meet the appropriate test level 3 NCHRP 350 crash test standards and shall be approved for use by the FHWA.

(a) Placement

Temporary ~~concrete~~ traffic barriers shall be located as shown on the plans or as directed. Temporary ~~concrete~~ traffic barriers located along a tapered alignment shall be flared at the rates as shown on the plans for the applicable regulatory speed within the construction zone. If field conditions are such that the required flare rate cannot be utilized, the tapered alignment may be altered, with approval, to a 10:1 flare rate with a 6 m (20 ft) minimum offset from the edge of the through traffic lane to the approaching end of the flared temporary ~~concrete~~ traffic barrier. If field conditions are such that the 10:1 flare rate cannot be utilized, the tapered alignment may be further altered, with approval, to a 6:1 flare rate with the 6 m (20 ft) minimum offset. The use of flare rates sharper than those shown on the plans may require additional traffic control devices as directed.

Type 2 barriers shall not be intermixed with type 1 or type 3 barriers in any run. Type 2 barriers from different manufacturer's shall not be intermixed in any run.

(b) Connection.

~~Temporary concrete~~ Type 1 and type 3 barrier sections shall be connected as follows:

1. *The adjacent barrier sections shall be placed end to end, with sufficient overlapping of the smooth bar hooks to allow placement of the connecting bolt or threaded rod and the top spacer.*

2. *The adjacent barrier sections shall then be moved in opposite directions for a sufficient distance to develop the maximum contact between the smooth bar hooks and the connecting bolt or threaded rod.*

3. *The bottom spacer and nut shall then be placed as shown on the plans. The nut shall be sufficiently tightened to eliminate all gaps between the adjacent bolt heads, spacers, nuts, and washers which form the connection.*

Type 1 and type 3 precast units which have previously been cast meeting earlier Department standards may be used. The Contractor will be allowed to mix type 1 and type 3 units in a run as long as the units are in good condition and the connecting devices are compatible. If units meeting earlier Department standards are used, a 25 mm (1 in.) bolt will be allowed to link the units together. The spacer detail shall, however, be in accordance with the current design. Units cast after March 1, 2003 shall be linked with the 30 mm (1 1/4 in.) bolt.

Type 2 temporary traffic barriers shall be connected as recommended by the barrier manufacturer.

(c) Anchorage.

~~Temporary concrete~~ Type 1 and type 3 temporary traffic barriers shall be anchored in accordance with the methods shown on the plans, at the locations described herein. Type 2 barriers shall be anchored as recommended by the barrier manufacturer and at locations described herein. Temporary ~~concrete barrier~~ traffic barriers shall be anchored when located on or within 18 m (60 ft) of a bridge, and along tapered

alignments. Anchoring at locations in addition to those described herein will be required when directed.

Chemical anchor systems with removable bolts, or mechanical anchors may be used to anchor ~~temporary concrete~~ type 1 barriers to bridge decks, concrete pavement, and concrete shoulders. Mechanical anchors may be ferrous or non-ferrous material. All anchors shall have a shear strength of 44.5 kN (10,000 lb) and an ultimate pullout strength of 29 kN (6,500 lb).

Non-ferrous mechanical anchors shall be installed such that the top end of the sleeve is a minimum of 60 mm (2 1/2 in.) below the final finished concrete surface.

Ferrous mechanical anchors shall be completely removed when no longer required. All damage to the concrete shall be repaired as directed with no additional payment.

Non-ferrous anchor sleeves and the chemical adhesive component of chemical anchor systems may remain in place when no longer required. The holes remaining in the concrete, after the removal of the bolts used with non-ferrous mechanical anchors and chemical anchor systems, shall be filled with appropriate material as directed, with no additional payment.

(d) Delineation.

~~Temporary concrete~~ Type 1 barriers used to separate two-way traffic shall be delineated with top mounted temporary barrier delineators and with side mounted delineators. The top mounted delineators shall be two-sided, shall be yellow, and shall be placed on every other section of barrier wall (±6 m or 20 ft spacing). The top mounted delineators shall be mounted perpendicular to the direction of traffic flow. The side mounted delineators shall be yellow and shall be mounted in accordance with 602.03(f).

Temporary ~~concrete~~ traffic barriers in locations other than separating two-way traffic shall be delineated with either type C construction warning lights or top mounted temporary barrier delineators and with side mounted barrier delineators. The type C lights or the top mounted barrier delineators shall be spaced at the number of meters equal to 0.3 times (number of feet equal to) the number of miles per hour in the posted speed limit with a minimum spacing of 6 m (20 ft). Bi-directional lenses will be required on the warning lights when the barrier is adjacent to a lane that is carrying alternating one way traffic. The color of the barrier delineators shall be white when located on the right side of the traffic lane, and yellow when located on the left side of the traffic lane. The color of the barrier delineators shall be white when located adjacent to a lane that is carrying alternating one-way traffic.

Where the temporary ~~concrete~~ traffic barrier is located along a tapered alignment and is located behind drums or other reflective delineation devices, the type C construction warning lights and barrier delineators shall not be used.

(e) End Treatment.

Where possible, the ends of temporary traffic barriers shall be flared and continued to a point outside the construction clear zone. The flare rates shall be in accordance with 801.10(a). Where conditions do not allow the temporary traffic barrier to be flared beyond the construction clear zone, appropriate end treatments shall be

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 801CONTINUED:

incorporated to protect the ends of the barriers from errant vehicles. Where necessary, construction zone impact attenuators shall be placed. The impact attenuators shall have re-direct capability.

(f) Storage.

No wall segments shall be stored on site unless written permission is given by the Department.

Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: 801-TCCB-01 thru 04
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

Item No. 1-7
Mr. Kucher
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 801, BEGIN LINE 714, DELETE AND INSERT AS FOLLOWS:

Temporary ~~concrete~~ traffic barrier will be measured by the meter (linear foot) per the type specified. Anchored temporary ~~concrete~~ traffic barrier will be measured by the meter (linear foot), separately from unanchored temporary concrete barrier per the type specified. Construction zone impact attenuators when used on a type 2 or type 4 temporary traffic barrier will be measured by the meter (linear foot) as part of the wall.

Other sections containing specific cross references: 713.08, Pg 518	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

Item No. 1-8
Mr. Kuchler
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 801, BEGIN LINE 771, DELETE AND INSERT AS FOLLOWS:

Temporary ~~concrete~~ traffic barrier and anchored temporary ~~concrete~~ traffic barrier will be paid for at the contract unit price per meter (linear foot) per the type specified. Payment will be made only once, regardless of the number of times the barrier is moved to accommodate different phases of traffic maintenance or construction operations as shown in the contract. Construction zone impact attenuators, cz when used on a type 2 or type 4 temporary traffic barrier will be paid for as part of the wall.

SECTION 801, BEGIN LINE 852, DELETE AND INSERT AS FOLLOWS:

Temporary ~~Concrete~~ Traffic Barrier, _____ ..... m (LFT)
type
Temporary ~~Concrete~~ Traffic Barrier, Anchored, _____..... m (LFT)

Type

SECTION 801, AFTER LINE 889, DELETE AND INSERT AS FOLLOWS:

The cost of end treatments and impact attenuators for type 2 and type 4 temporary traffic barriers shall be included in the cost of the barrier.

The cost of delineation of temporary ~~concrete~~ traffic barrier shall be included in the cost of temporary ~~concrete~~ traffic barrier.

Other sections containing specific cross references:

408.08, Pg 438SS
713.09, Pg 518

General Instructions to Field Employees
Update Required? Y___ N___
By - Additional or Revision
Frequency Manual
Update Required? Y____ N____
By – Addition or Revision

Recurring Special Provisions potentially affected:

NONE

Standard Sheets potentially affected:

NONE

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn. Resubmit? _____

Received FHWA Approval? ____

Item No. 1-9
Mr. Caplinger
Date: 1/20/05

REVISION TO STANDARD DRAWINGS

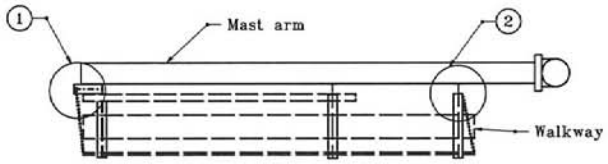
802-SNWW-07 Sign Walkway Details

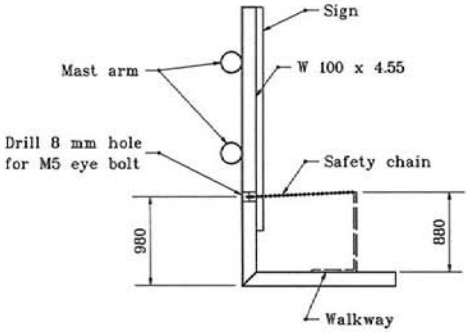
Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: See Above
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

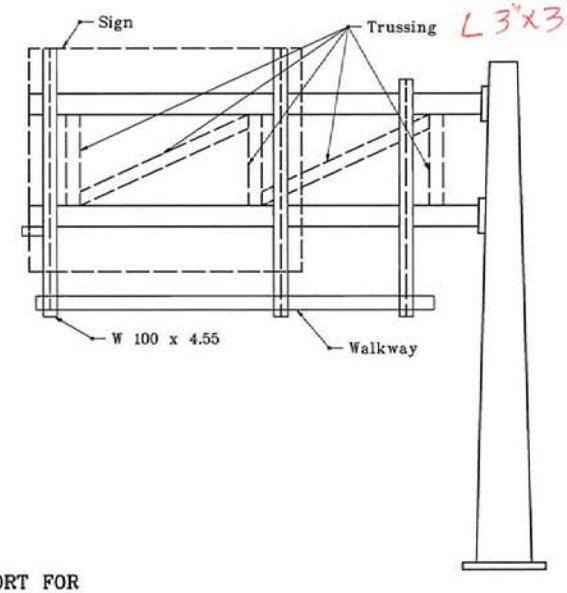
GENERAL NOTE

(1) See Standard Drawing 802-SNWW-08 for Detail A.

(2) See Standard Drawing 802-SNWW-08 for Detail B.







CHAIN SUPPORT FOR
DOUBLE MASTARM CANTILEVER
(BOX TRUSS SIMILIAR)

All dimensions are in mm unless otherwise specified.

INDIANA DEPARTMENT OF TRANSPORTATION

SIGN WALKWAY DETAILS

SEPTEMBER 2001

STANDARD DRAWING NO. 802-SNWW-07

ANTHONY L. UREMOVICH REGISTERED No. 18095 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Anthony L. Uremovich 9-04-01
DESIGN STANDARDS ENGINEER — DATE

/s/ Firooz Zandi 9-04-01
CHIEF HIGHWAY ENGINEER — DATE

Item No. 1-10
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 17, DELETE AND INSERT AS FOLLOWS:

Reinforcing bars ~~will be jobsite sampled in accordance with the Frequency Manual and, when shipped to the project site, the bars shall be accompanied by the types of certifications specified in the Frequency Manual and in accordance with 916. As an alternate procedure, the reinforcing bars may~~ *shall* be furnished by selecting bars made by a manufacturer on the list of Certified Uncoated Reinforcing Bar Manufacturers and in accordance with ITM 301. When shipped to the project site, the reinforcing bars shall be accompanied by the type of certifications specified in ITM 301 and in accordance with 916.

Other sections containing specific cross references:

602.02, Pg 351
604.02, Pg 358
605.02, Pg 362
607.02, Pg 367
615.02, Pg 381
701.02, Pg 422
703.02, Pg 465
704.02, Pg 469
705.02, Pg 472
706.02, Pg 474
707.02, Pg 476
714.02, Pg 519
715.02, Pg 522
717.02, Pg 538
718.02, Pg 541
719.02, Pg 544
720.02, Pg 547
802.02, Pg 821 SS
807.03, Pg 613

General Instructions to Field Employees
Update Required? Y___ N___
By - Additional or Revision

Frequency Manual
Update Required? Y____ N____
By – Addition or Revision

Recurring Special Provisions potentially affected:

NONE

Standard Sheets potentially affected:

NONE

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn. Resubmit? _____

Received FHWA Approval? ____

Item No. 1-11
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 96, DELETE AND INSERT AS FOLLOWS:

9. Epoxy Coated Reinforcing Bars

Epoxy coated reinforcing bars ~~will be jobsite sampled in accordance with the Frequency Manual. As an alternate procedure, the reinforcing bars may~~ *shall* be furnished by selecting bars coated from an applicator's plant on the list of Certified Reinforcing Bar Epoxy Coaters and in accordance with ITM 301. The epoxy coating material shall be selected from the list of approved Epoxy Coating for Steel.

Other sections containing specific cross references: 703.04. Pg. 466	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 143, DELETE AND INSERT AS FOLLOWS:

10. Dowel Bars

Dowel bars shall be plain billet steel in accordance with ASTM A 615, grade 40 (A 615M, grade ~~300~~ *280*), except the bend test and elongation requirements will not apply. The dowel bar area and weight (mass) for the nominal bar diameter shall be as follows.

SECTION 910, BEGIN LINE 162, DELETE AND INSERT AS FOLLOWS:

Dowel bars ~~will be jobsite sampled in accordance with the Frequency Manual and, when shipped to the project site, the bars shall be accompanied by the types of certifications specified in the Frequency Manual and in accordance with 916. As an alternate procedure, the dowel bars may~~ *shall* be furnished by selecting bars made by a coater and manufacturer on the list of approved Certified Reinforcing Bar Epoxy Coaters and in accordance with ITM 301. When shipped to the project site, the dowel bars shall be accompanied by the types of certifications specified in ITM 301 and in accordance with 916.

Other sections containing specific cross references: NONE	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

Item No. 1-13
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 444, INSERT AS FOLLOWS:

910.09 Guardrail

Guardrail of the same type shall be interchangeable regardless of the source. *Guardrail shall be supplied by a Certified Guardrail Supplier selected from the Department list of Approved Certified Guardrail Supplier.*

Other sections containing specific cross references: 601.02. Pg 347	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 633, DELETE AND INSERT AS FOLLOWS:

910.12 ~~Samples and~~ Certification of Guardrail~~, Posts, Accessories, Fittings, and Hardware~~ *Suppliers*

~~All samples required for testing purposes shall be furnished free of charge. General requirements for sampling are as follows:~~

~~(a) Control Procedure for Furnishing Steel Beam Guardrail and Accessories~~

~~All steel beam guardrail and accessories shall be subject to one of the two control procedures as follows:~~

~~1. installers on a certification basis with random in-place testing of guardrail;~~

~~2. installers not qualifying or not desiring certification basis with job control sampling.~~

~~Installers~~ *Suppliers* desiring to be on certification status will be approved upon request *and added to the Department's list of approved Certified Guardrail Suppliers*. The *written* request ~~need not be in writing, but it shall be requested through the Division of~~ *shall be submitted to the* Materials and Tests *Division*. ~~A 6-digit~~ *An* approval number will be assigned to each ~~installer~~ *supplier* to be used for identification ~~acceptability~~ of *acceptable* material.

The ~~installer~~ *supplier* shall perform testing or shall obtain documentation to ensure the quality of the material incorporated into the work.

The ~~installer~~ *supplier* shall prepare ~~and attach~~ to each monthly ~~material record~~ a *type D* certification in accordance with ~~916.02(d)~~ *916.02(e)*. Such certification shall contain the contract number; ~~installer's~~ *supplier's* name; ~~installer's~~ *supplier's* approval number; month of installation; rail manufacturer; bolt manufacturer; quantities of rail, channel, posts, block, and paddle posts incorporated into the work; quantities of sawed timber posts and blocks for thrie-beam and W-beam guardrail incorporated into the work; and a ~~notarized~~ statement ~~sworn by a person having legal authority to bind the company preparing the certification~~ that the materials furnished are in accordance with 910.09 through 910.12.

The Department will inspect the steel beam guardrail on a randomly selected contract for compliance with specifications for a minimum of one time per year per ~~installer~~ *supplier*. ~~The inspections will be performed before the contract is certified by the Division of Materials and Tests. Various dimensional checks, various coating thickness determinations, proper identification checks for rail and bolts, bore cores for determination of preservative retention, and penetration for sawed timber posts and blocks for end sections will be performed.~~

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910 CONTINUED:

~~Randomly selected~~ *Selected* contracts with failing results will be ~~issued a Failed Materials Report. Failed materials will be subject to action by the Failed Materials Committee~~ *adjudicated as a failed material in accordance with normal Department practice.*

If the ~~installer~~ *supplier* shows negligence or the inability to ensure the delivery of specified materials, the ~~installer's~~ *supplier's* ~~immediate usage status~~ may be removed *from the approved list.*.

~~Suppliers not desiring to retain their certification or who lose status will have their material sampled at the project site after delivery. No material may be used until it has been tested and approved.~~

~~Samples will be obtained from materials after delivery to the jobsite or while being held in inventory at the Contractor's yard, if it is located in an area normally serviced by the Department.~~

~~(b) Aluminum Guardrail~~

~~Rails, posts, accessories, fittings, and hardware will be accepted based on a visual inspection confirming the physical dimensions conform to the requirements as shown on the plans and a type C certification in accordance with 916.~~

Other sections containing specific cross references:

601.02, Pg 347

General Instructions to Field Employees
Update Required? Y___ N___
By - Additional or Revision
Frequency Manual
Update Required? Y____ N____
By – Addition or Revision

Recurring Special Provisions potentially affected:

NONE

Standard Sheets potentially affected:

NONE

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn. Resubmit? _____

Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 690, DELETE AND INSERT AS FOLLOWS:

910.13 Steel Fence Posts

Tubular steel fence posts and line posts shall meet the following specifications and the requirements as shown on the plans.

(a) Line Posts

~~All posts except tubular steel fence~~ *Line* posts shall be galvanized in accordance with ~~ASTM A 123, except the weight (mass) of the coating per square foot (square meter) of actual surface on anchor plates attached to posts shall average no less than 1.50 oz (458 g) and shall be no less than 1.25 oz (382 g) for any individual specimen. Posts and anchor plates for line posts shall be of good commercial quality steel and of the shapes, weights, and dimensions shown on the plans~~ *AASHTO M 281 and galvanized in accordance with AASHTO M 111, Coating grade 65.*

Line posts for farm field fence shall be furnished with anchor plates. End, corner, pull, and gate posts for farm field type fence shall be furnished with braces and all fittings and details required to make a complete installation as shown on the plans.

~~(a)~~ *(b)* Tubular Steel Fence Posts

Two groups of tubular steel fence posts are included in these specifications. Tubular section posts shall have heavy malleable iron caps or pressed galvanized steel caps. Such caps shall be made to provide a drive fit over the outside of the section to exclude moisture. The weight (mass) per foot (meter) for tubular posts and braces shall be no less than 90% of the weight (mass) specified. Unless specified otherwise, the tubular steel fence post shall be group 1.

1. Group 1

Tubular steel fence posts for group 1 shall be hot-dipped zinc-coated and shall be in accordance with ASTM F 1083 except tests shall be conducted on sample posts selected as being representative of the posts furnished. The weight (mass) per foot (meter) will be acceptable provided it is at least 90% of the specified weight (mass).

2. Group 2

Tubular steel fence posts for group 2 shall have a minimum 50 ksi (345 MPa) yield strength and be in accordance with AASHTO M 181, except that the inner pipe surface may be galvanized in lieu of a zinc rich coating or hot dipped aluminum coated, Type 2, meeting the chemical requirements of AASHTO M 274. The aluminum coated, Type 2, steel fence posts shall be manufactured by roll forming aluminum coated, Type 2, steel strip and electric resistance welding it into tubular form. The outside of the weld area shall be metallized with commercially pure aluminum to a thickness sufficient to provide resistance to corrosion equal to that of the remainder of the outside of the post. The aluminum coating weight (mass) shall be a minimum of 0.75 oz/sq ft (229 g/m^2) average, and 0.70 oz/sq ft (214 g/m^2) for an individual test specimen, as measured in accordance with ASTM A 428. Specimens for determining weight of coating shall be obtained in accordance with ASTM F 1083.

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, CONTINUED.

~~(b)~~ *(c)* Fence Fastenings

When fastenings are necessary for attaching the farm field fence to the posts, they shall be either galvanized or aluminum coated No. 9 (3.8 mm) wire, or galvanized or aluminum coated clamps of the manufacturer's standard design. The coating weights shall be a minimum of 0.60 oz/sq ft and 0.30 oz/sq ft (183 g/m^2 and 92 g/m^2) for galvanized and aluminum coated, respectively. A sufficient quantity of individual tie wires or clamps shall be furnished to provide for five attachments of the fencing to each line post and one tie wire for ea

Other sections containing specific cross references: 603.02, Pg 355	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

Item No. 1-16
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 1016, DELETE AND INSERT AS FOLLOWS:

4. Barbed Wire

Barbed wire used at the top and bottom of farm field fence, or as otherwise specified, and in accordance with 603 shall be in accordance with applicable provisions of ASTM A 121. It shall be composed of No 12 1/2 gage (2.5 mm) galvanized or aluminum coated steel wire with four round 14 gage (2.0 mm) barbs at approximately 5 in. (125 mm) spacing. The galvanized coating shall be in accordance with class 3 in Table ~~3~~ *2*. The minimum aluminum coating ~~weights (mass)~~ shall be ~~0.30 and 0.25 oz/sq ft (91.5 and 76.3 g/m^2) on the 12 1/2 gage (2.5 mm) wire and 14 gage (2.0 mm) barbs respectively~~ *in accordance with class 60 for the line wire and class 20 for the barb wire*. The weight (mass) of coating shall be determined in accordance with ASTM A 428. The use of aluminum barbs, in accordance with ASTM B 211 (B 211M), alloy 5052-H38, nominal diameter ~~0.080 in.~~ *No. 14 gage* (2.0*3* mm), will be permitted.

The use of barbed wire with No. 15 1/2 gage (1.7*0* mm), high tensile strength line wires, and No. 16 1/2 gage (~~1.5~~ *1.47* mm) barbs will be permitted. The barbs shall be round with four points and spaced at approximately 5 in. (125 mm) intervals. The barbed wire shall be in accordance with ASTM A 121~~, except the minimum weight (mass) of zinc coating shall be 0.75 oz/sq ft (229.0 g/m^2) for line wires and 0.70 oz/sq ft (214.0 g/m^2) for barbs~~. *The galvanized coating shall be in accordance with class 3 in Table 2.*

Other sections containing specific cross references: 713.02 Pg 517	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: NONE
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 913, BEGIN LINE 73, DELETE AND INSERT AS FOLLOWS:

913.07.1 ~~Flexible Channelizer and Flexible~~ Tubular Marker (923.06 - 2006 Book)

The vertically placed portion of ~~each~~ *this* device shall consist of high density polyethylene plastic in accordance with ASTM D 5203. *The vertical portion facing oncoming traffic shall provide a 3 in. (75 mm) wide viewing area and a minimum of 2 in. (50 mm) wide in all other directions. The vertical portion shall be straight along its center line and have a smooth surface free from cracks, flaws, seams, laps, blisters, and edges affecting the strength, durability, or appearance.* The base material shall be butyl rubber in accordance with ASTM D 5900 *or high impact polystyrene in accordance with ASTM D 4549*. Epoxy material used to attach the base to the roadway surface shall be in accordance with the manufacturer's recommendations. The tubular portion ~~of the flexible tubular marker~~ shall be ~~covered~~ with *reflectorized* with high intensity reflective sheeting in accordance with ~~913.10(d)~~ *919.01(b)1* as shown on the plans.

When installed, the flexible post shall withstand, without damage, five vehicle impacts at ambient air temperatures of 32°F (0°C) and at 85°F (30°C) each. The vehicle impacts shall include both bumper and tire impacts. It shall be able to bend to an angle of 85 degrees from vertical and right itself to within 10 degrees of the vertical immediately and stand erect within 4 h within the same ambient air temperature range.

Other sections containing specific cross references: 801.02, Pg 801 SS	General Instructions to Field Employees Update Required? Y___ N___ By - Additional or Revision Frequency Manual Update Required? Y____ N____ By – Addition or Revision
Recurring Special Provisions potentially affected: NONE	Standard Sheets potentially affected: 801-TCDV-01 and 02
Motion: Mr. Second: Mr. Ayes: Nays:	Action: Passed as submitted; revised Effective - _____ Letting _____ Supplementals Withdrawn. Resubmit? _____ Received FHWA Approval? ____

Item No. 1-18
Mr. Poturalski
Date: 1/20/05

REVISION TO STANDARD DRAWING

801-TVDV-01 Channelizing Devices
801-TCDV-02 Channelizing Devices

Other sections containing specific cross references:

NONE

General Instructions to Field Employees
Update Required? Y___ N___
By - Additional or Revision
Frequency Manual
Update Required? Y____ N____
By – Addition or Revision

Recurring Special Provisions potentially affected:

NONE

Standard Sheets potentially affected:

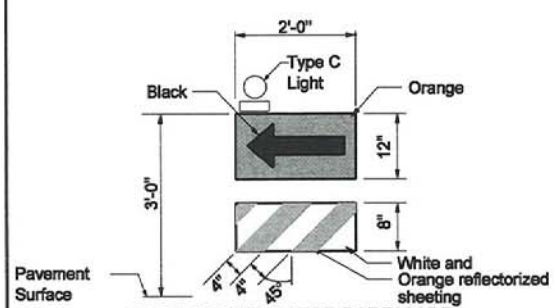
See Above

Motion: Mr.
Second: Mr.
Ayes:
Nays:

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

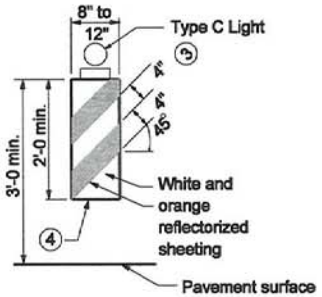
Withdrawn. Resubmit? _____

Received FHWA Approval? ____



DIRECTION INDICATOR BARRICADE

Use: X

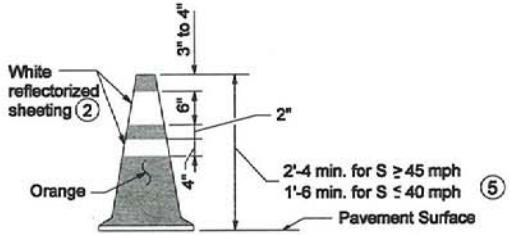


VERTICAL PANEL (9)

Use: O O O X

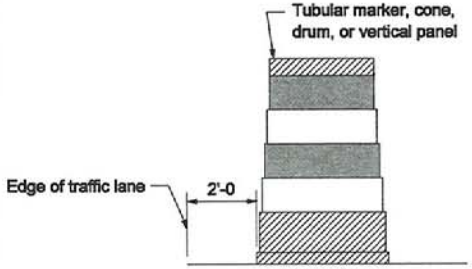
GENERAL NOTES

1. For additional notes and legends see Standard Drawing E 801-TCLG-01 or E 801-TCDV-02.
2. A Type C warning light will be required on tapers where there is a reduction in the number of lanes and a flashing arrow sign is used..

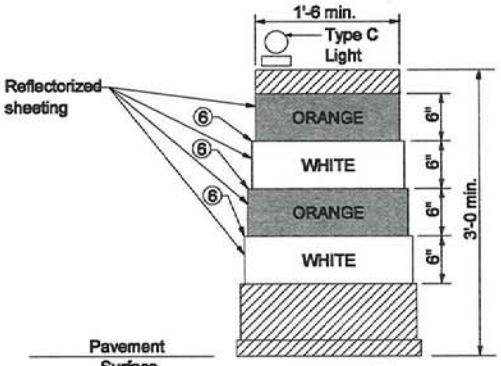


CONE

Use: O X X X

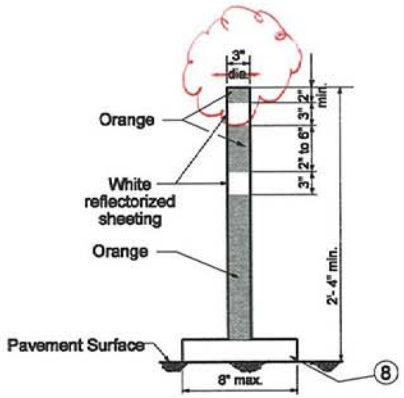


PLACEMENT OF CHANNELIZING DEVICES



DRUM (9)

Use: O X



FLEXIBLE TUBULAR MARKER

Use: O X X

INDIANA DEPARTMENT OF TRANSPORTATION

CHANNELIZING DEVICES

SEPTEMBER 2005

STANDARD DRAWING NO. E 801-TCDV-01

RICHARD L. VANCLEAVE REGISTERED NO. 9750 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Richard L VanCleave 3-01-05
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 3-01-05
CHIEF HIGHWAY ENGINEER DATE

...\801-TCDV-01_Rev_Sep_2004_Richa 01/03/2005 01:22:13 PM

GENERAL NOTES

1. Unless otherwise specified, channelizing devices shall be spaced as shown on Standard Drawing E 801-TCLG-01.
2. Reflectorized bands may be omitted from cones for lane closures during daylight hours.
3. For vertical panels greater than 3 ft in height, the width of the stripes shall be 6 in.
4. Vertical panels used on an expressway or a freeway shall have a minimum reflective panel area of 270 sq. in. Other roadways with a posted speed limit of 50 mph or greater shall have a minimum reflective panel area of 270 sq. in., also.
5. Cones shall have a minimum height of 2'-4" when used at night.
6. The maximum distance between the edges of adjacent reflective sheeting strips shall be 2 in.
7. Panel and direction indicator barricades and supports shall meet NCHRP 350 crash evaluation criteria.
8. Minimum flexible tubular marker base area shall be 0.3 sq. ft.
9. It is not necessary to delineate a drop-off of 3 in. or less adjacent to active travel lanes. Where channellizing devices are used to delineate drop-offs of 3 in. or less adjacent to active travel lanes, at least 33 in. of the device shall be above the adjoining pavement surface. Where channelizing devices are used to delineate a drop-off greater than 3 in. adjacent to active travel lanes, at least 27 in. of the device shall be above the adjoining pavement surface and a Type C warning light shall be attached to the top of the device (on the pavement side). In no case shall more than 9 in. of the device be below the adjoining pavement surface.
10. The proper orientation in respect to approaching vehicular traffic shall be maintained on vertical panels. Drums are the preferred channelizing device in a tight radius curve. 1 and flexible tubular markers

LEGEND

O - Device may be used in tangent set-ups.

X - Device may be used in taper or transition set-ups.

(X) - Devices may be used in two-way traffic set-ups to divide opposing lanes of traffic.

(●) - Device may be used to divide two or more lanes of traffic in the same direction.

(O) - Device may be used to replace barricades and drums where space is limited.

[O] - Device may be used to delineate edge of pavement drop-off where space is limited.

INDIANA DEPARTMENT OF TRANSPORTATION

CHANNELIZING DEVICES

SEPTEMBER 2005

STANDARD DRAWING NO. E 801-TCDV-02

RICHARD L. VANCLEAVE REGISTERED No. 9750 STATE OF Indiana PROFESSIONAL ENGINEER

DESIGN STANDARDS ENGINEER

/s/ Richard L. VanCleave 9-03-02
DESIGN STANDARDS ENGINEER DATE

/s/ Richard K. Smutzer 9-03-02
CHIEF HIGHWAY ENGINEER DATE

...\801-TCDV-02_Rev_Sep_2004_Richa 01/03/2005 01:22:51 PM

Item No. 1-19
Mr. Miller
Date: 1/20/05

REVISION TO 2006 STANDARD SPECIFICATIONS

SECTION 915, BEGIN LINE 189, DELETE AND INSERT AS FOLLOWS:

TABLE B

ASTM Standard	Physical Properties	50 Duro	60 Duro	70 Duro
D 2240	Hardness	50 ± 5	60 ± 5	70 ± 5
D 412	Tensile Strength, min. psi	2500	2500	2500
	(kPa)	(17 240)	(17 240)	(17 240)
	Ultimate Elongation, Min. %	400	350	~~350~~ *300*

Other sections containing specific cross references:

707.02, Pg 476
711.02, Pg 491

Recurring Special Provisions potentially affected:

NONE

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Additional or Revision
Frequency Manual
Update Required? Y____ N____
By – Addition or Revision

Standard Sheets potentially affected:

NONE

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn. Resubmit? _____

Received FHWA Approval? ____

SMITH, DAN

From: MILLER, MARK
Sent: Wednesday, November 24, 2004 7:09 AM
To: SMITH, DAN
Subject: Proposed Revision to 915.04, bearing pads

This revision is proposed to Table B for neoprene bearing pads to match our specification to the AASHTO material specification. Our specification matched the AASHTO spec in 1971, was changed in 1974 and has remained as is since. We could find no reason to explain the deviation from AASHTO, and since our suppliers provide material to many states, we feel we will have fewer problems with failed test reports and will still get a product that has satisfactory material properties.

Mark A. Miller
Chief, Materials & Tests Division
Indiana Department of Transportation
120 S. Shortridge Road
Indianapolis,IN 46219-0389
Ph. 317-610-7251, ext 204
Fax 317-356-9351

11/24/2004

Item No. 1-20
Mr. Cales
Date: 1/20/05

POLICY REVISION

This item proposes the adoption of AASHTO's *Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400)* as an addition to the Department's Design Manual.

Other sections containing specific cross references:

NONE

Recurring Special Provisions potentially affected:

NONE

Motion: Mr.
Second: Mr.
Ayes:
Nays:

General Instructions to Field Employees
Update Required? Y___ N___
By - Additional or Revision
Frequency Manual
Update Required? Y____ N____
By – Addition or Revision

Standard Sheets potentially affected:

NONE

Action: Passed as submitted; revised
Effective - _____ Letting
_____ Supplementals

Withdrawn. Resubmit? _____

Received FHWA Approval? ____

INDIANA DEPARTMENT OF TRANSPORTATION

INTER-DEPARTMENT COMMUNICATION

Standards Section – Room N642

Writer's Direct Line
232-6775

January 5, 2005 DRAFT

DESIGN MEMORANDUM No. 05-__
POLICY CHANGE

TO: **All Design, Operations, District Personnel, and Consultants**

FROM: _____
Anthony L. Uremovich
Design Policy Engineer
Contracts and Construction Division

SUBJECT: **Design of Low-Volume Local Roads**

COMPLEMENTS: ***Indiana Design Manual*** **Sections 40-1.01(02) and (03)**

EFFECTIVE: With Design Approval after _____, 200_

All roads which are functionally classified as local roads or collectors with ADT ≤ 400, including those which are S-lines to other projects, should, as a minimum, be designed in accordance with AASHTO's *Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT ≤ 400).*

The designer should use the edition of the subject document that is current at the time of design approval.

alu

[F:\Des\05LVLR-pc.doc]